CHAPTER 7:
Evaluating Air Emissions: NH Regulated Toxic Air Pollutants (RTAPs)

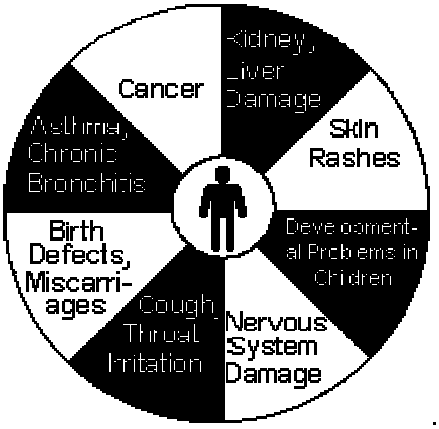
The **NH Air Toxics Control Program**, originally enacted in 1987 and revised in 1996, protects public health by reducing human exposure to toxic air pollutants. For printers, air toxics may be used in blanket and roller washes, fountain solutions, and developer solutions.

What are Toxic Air Pollutants?

Toxic air pollutants are those pollutants that, at sufficient concentrations and exposure, are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or to cause adverse environmental effects. In general, the toxic air pollutants which are of greatest concern are those that are released to the air in large enough amounts to create a risk to human health, and have the potential to reach many people.

What are the Effects of Toxic Air Pollutants?

The emission of toxic pollutants into the air can have serious effects to human health and the environment. Human exposure to these pollutants can include both short-term (acute) and long-term (chronic) complications. Many factors can affect how different toxic air pollutants may impact human health, including the quantity which a person is exposed to, the duration and frequency of the exposure, the toxicity level of the pollutant, and the person's overall health and level of resistance or susceptibility. Short-term exposures can include effects such as eye irritation, nausea or difficulty in breathing. Long-term exposures to many air toxics may result in damage to the respiratory or nervous systems, birth defects, and reproductive effects. In addition, toxic air pollutants can have indirect effects on human health through deposition onto soil or into lakes and streams, potentially affecting ecological systems and eventually human health through consumption of contaminated food.



New Hampshire's Air Toxic Rule: Env-A 1400

To protect New Hampshire residents from the affects of toxic air pollutants, the New Hampshire Air Toxics Control Program was enacted in 1987 and revised in 1996. The program is codified in NH RSA Chapter 125-I Air Toxics Control Act and in NH Code of Administrative Rules Chapter Env-A 1400 Regulated Toxic Air Pollutants.

Env-A 1400 regulates the emissions of 750 regulated toxic air pollutants (RTAPs) which have a health-based risk to humans and are likely used by business and industry in the state. The regulation affects all stationary sources which may emit any of the 750 RTAPs in the ambient air. The aim of the regulation is to protect public health and the environment by establishing ambient air limits (AALs) and requiring businesses in the state to reduce their emissions of any of the 750 listed RTAPs such that they do not impact the downwind air quality at levels that may exceed the established AALs. The entire list of 750 RTAPs is located in Appendix F.

Where do Printers Typically use RTAPs?

RTAPs may be used in printing facilities in a number of places: fountain solutions, blanket and roller washes, meter roller cleaners, screen cleaning solutions, some inks, and pre-press chemistry such as developer and fixer. To determine if you use any RTAPs, look at the material safety data sheets (MSDS) under the section labeled "Hazardous Ingredients" (typically found in Section II). Examples of some commonly used RTAPs are listed in the table below.

Examples of RTAPs Used at Printing Facilities

Source	RTAP Name	CAS #
Fountain Solutions	Isopropanol	67-63-0
	2-Butoxyethanol	111-76-2
	Ethylene Glycol	107-21-1
	Acetic Acid	64-19-7
Blanket & Roller Washes, Cleaning Solutions	Cumene	98-82-8
	1,2,4-Trimethylbenzene	95-63-6
	Xylene	1330-20-7
	Ethyl Benzene	100-41-4
	Ethanol	64-17-5
	Toluene	108-88-3
	Cyclohexane	110-82-7
	Naphthalene	91-20-3
Meter Roller Cleaner	Methylene Chloride	75-09-2
	Acetone	67-64-1
	Xylene	1130-20-7
	Methylpyrrolidone	872-50-4
Lithographic Inks	Barrium	7440-39-3
	Zinc	7440-66-6
Screen Inks	2-Butoxyethanol	111-76-2
	2-Butoxyehtanol Acetate	112-07-02
	Titanium Dioxide	13463-67-7
	Barrium Sulfate	7727-43-7
	Carbon Black	1333-86-4
	Lead	7439-92-1
Developer & Fixer	Hydroquinone	123-31-9
	Phosphoric Acid	7664-38-2

Material Substitution

After you have determined that your facility uses products that contain RTAPs, the next step is to evaluate if another product may be used that contains either no RTAPs or RTAPs at lower concentrations than the existing product. Here are some examples:

Cleaning Solutions: Vendors provide many products used for cleaning presses or screens. You should work with your vendor to choose a product with lower percentages of RTAPs. Also, you should avoid products that contain high percentages of Toluene or Xylene. Typically, cleaning solutions with vapor pressures below 10 mmHg will have lower amounts of RTAPs.

Fountain Solutions: Alcohol substitutes typically contain RTAPs such as 2-Butoxyethanol and Ethylene Glycol. You will not be able to eliminate these chemicals, however, you may be able to find a substitute that contains lower percentages of these chemicals.

Meter Roller Cleaner: Many vendors have products with names such as "Low VOC MRC" or "Low HAP MRC". You should change to one of these products if your current meter roller cleaner contains Methylene Chloride. Also, make sure your facility is not overusing MRC when a Blanket or Roller Wash can be used. Typically Blanket and Roller Washes contain fewer amounts of RTAPs than meter roller cleaners.

Screen Inks: Solvent-based screen inks contain products such as 2-butoxyethanol or 2-butoxyethanol acetate which are both RTAPs. Although not an easy change, alternate screen inks should be evaluated such as water-based or UV-curable which typically contain lower percentages of RTAPs.

How do you Determine Compliance with Env-A 1400?

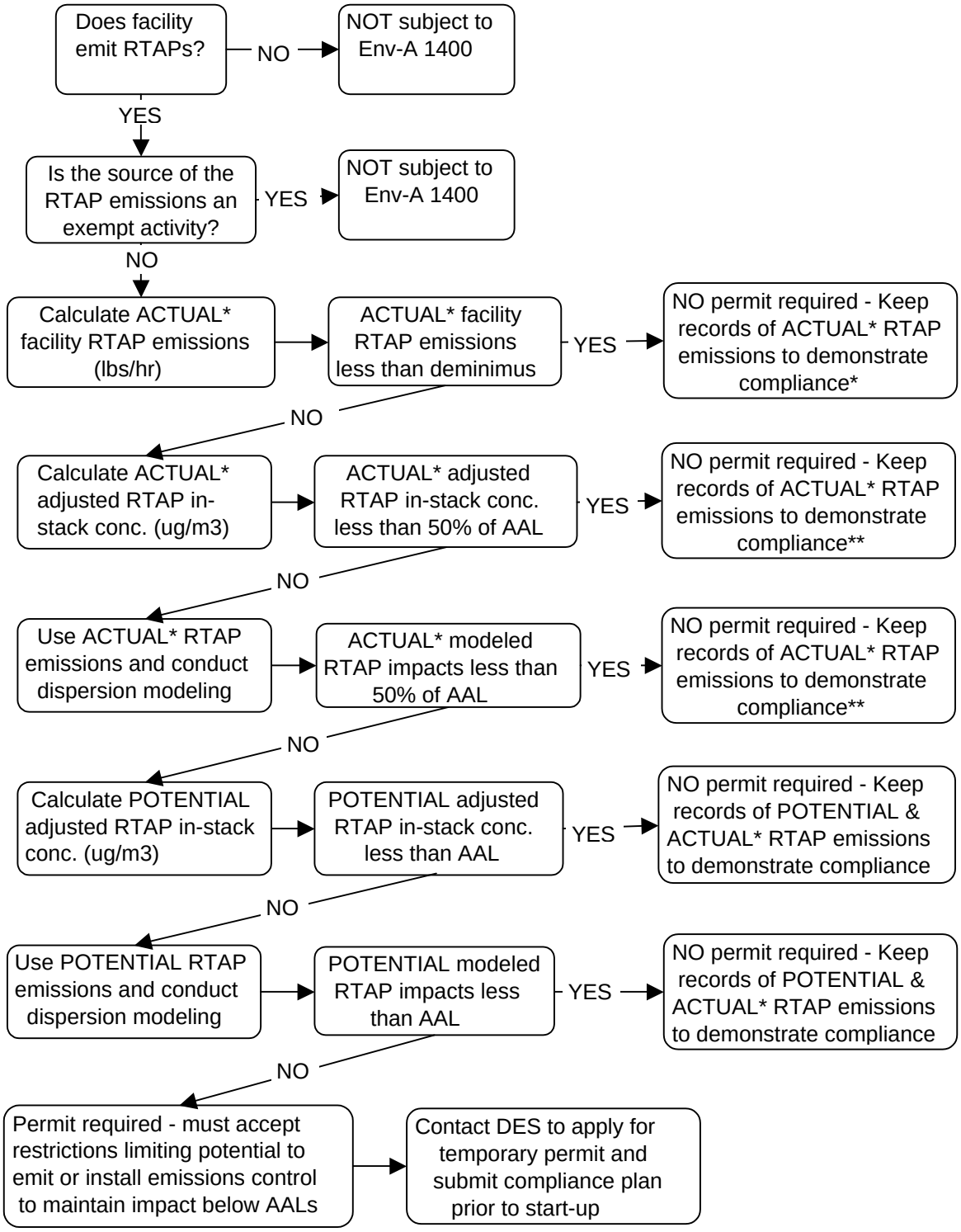
The NHDES has given facility's three ways to determine compliance with the Air Toxics Rule, Env-A 1400. Each way is more complex than the next. The basis for these determinations is to ensure that the ambient air levels (AALs) for each RTAP are not exceeded at the property boundary. Short-term (24-hr) and long-term (annual) AALs were established based on current scientific literature and are the basis for each of the three compliance methods. The three methods are as follows:

- De minimus calculations: Set levels based on material usage amounts for each RTAP.
- In-Stack Concentration Method: Assumes that if the RTAP concentration in the stack is below the AAL for that RTAP that there is no way the AAL can be exceeded at the property boundary.
- Air Dispersion Modeling: Computer modeling calculations based on several factors including material usage amounts, stack location, stack height, distance to property boundary, fan size, etc. This calculation must be determined either by the NHDES or a qualified environmental consultant.

Calculations may be based on "actual" facility usage data using the flow chart on the following page:

Env-A 1400 Compliance Determination Flow Chart

(revised 6/15/01)



* Note that ACTUAL emissions are UNCONTROLLED emissions.

** Note that even when a source can use actual emissions to demonstrate compliance with Env-A 1400 under this policy, it may still be necessary to calculate potential emissions of other pollutants to determine the applicability of other regulations such as VOC RACT, Title V, Title III, etc.

De Minimus Emission Level Method

The NHDES has developed worksheets that assist with the compliance determination using the de minimus emission level method. These worksheets are on pages 7-6 through 7-8.

Worksheet 1: Assists you with determining what RTAPs are currently used at the facility. To complete this worksheet you will first need to obtain material safety data sheets (MSDSs) for chemical products used at your facility.

After obtaining the MSDSs, review the "Hazardous Ingredients" section of each MSDS to determine if any of the chemical constituents of the product are considered RTAPs. Since many individual chemicals may have more than one name, you should check the RTAP list by the Chemical Abstracts Service (CAS) number. Each chemical only has one CAS number.

If any chemicals listed on the MSDS are on the RTAP list (see Appendix E), you should list product and the RTAP on Worksheet 1. Do this for each MSDS for products that you use.

Worksheet 2 & 3: Assists with the emissions calculations for each RTAP. You should complete Worksheets 2 & 3 for each RTAP that is used at your facility. To complete these worksheets you will need the following:

- MSDS for each product that contains a RTAP.
- Usage amounts or purchase records for the past 12 months for each product that contains a RTAP.

After Completing the Three Worksheets for Each RTAP:

- Check the calculated annual de minimus and 24-Hour de minimus with the de minimus levels for the RTAP located in Appendix F.

- If both calculated de minimus levels are below the Appendix F de minimus levels for each RTAP, your determination is complete. Your RTAP level is 1, and no permit is required. Go to Chapter 8.

- If your calculations have exceeded the Appendix E de minimus levels for any RTAP, submit the completed Worksheets 1, 2 & 3 with your PrintSTEP Application and the NHDES will determine your Env-A 1400 compliance status for you. Continue to Chapter 8. Your RTAP level will be determined by NHDES. Facilities that do not require permit conditions are considered RTAP Level 1. Facilities that require RTAP permit conditions are considered RTAP Level 2.

Worksheet 1

Env-A 1400 Emissions Compliance Worksheet
Determination of Regulated Toxic Air Pollutants (RTAPs) Used

Facility Name: _____ Primary Business: _____
Address: _____ Telephone: _____
_____ Contact: _____
Material Usage Basis: MSDS ☐ AP-42 ☐ Other ☐ Title: _____

Material Used	Product ID	Compound	CAS Number	Information Source*	RTAP (Y/N)	Emission Point

* If information is from MSDS, attach copies. If information is from another source, please identify and attach documentation.

Worksheet 2

Env-A 1400 Emissions Compliance Worksheet
Determination of RTAP Fate and Emissions

Facility Name: _____ Primary Business: _____
Address: _____ Telephone: _____
_____ Contact: _____
Title: _____

				A	B	C=(A*B)/100			D	E=(C*D)/100
Material / Product ID	Use Location*	RTAP	CAS Number	Product Density (lb/gallon)	RTAP Percentage (% by weight)	RTAP Density (lbs/gal)**	Is 100% of RTAP Emitted? (Y/N)	If RTAP is NOT fully emitted - decribe RTAP fate***	Proportion Emitted (% by weight)	Corrected RTAP Density (lbs/gal)****

* Use Location: Describe where the product is used and/or emitted. List product at each location where it is used.
Examples: "spray booth #2" or "off-set press #1" or "roof vent".

** RTAP concentration (lb/gal) = product density (in lb/gal) times % RTAP by weight given on Material Safety Data Sheet divided by 100:
Example: Product density: 8.5 lb/gallon, 10% xylene by weight.
==> RTAP (lb/gal) = (8.5)*(10)/100 = 0.85 lb/gal xylene

*** If RTAP is not emitted ito the air, describe its fate.
Example: "Titanium dioxide is a non-volatile component of the pigment in coating # 1444. Since it is roller-applied, 100% is retained on the product to which it is applied".

**** Portion of RTAP that would be emitted after subtracting out portion that would be retained. This value should be used to calculate air emissions (Worksheet 3).
Example: "Titanium dioxide is a non-volatile component of 'the pigment in coating # 1444. Since it is applied with an HVLP spray gun, 60% is retained on the product to which it is applied and 40 % is emitt
==> In this case, the lb/gal RTAP content would be multiplied by 0.4 to obtain the corrected RTAP lb/gal content.

Worksheet 3

Env-A 1400 Emissions Compliance Worksheet

RTAP Emissions and Compliance Determination: Deminimus Emission Level Method

Facility Name: _____ Primary Business: _____

Address: _____ Telephone: _____

_____ Contact: _____

Title: _____

Compliance Basis: Actual ☐ Potential* ☐ Other* ☐

Pollutant: _____

CAS#: _____

		A	B	C	D	E=A*D		F=C*D		
Product ID	Use Location	Maximum Use Rate** (gal/hr)	Maximum Use Rate** (hrs/day)	Maximum Use Rate** (gal/yr)	Corrected RTAP (lbs/gal) (From Worksheet 2)	Maximum Emissions*** (lbs/hr)	24-hr Deminimus (lbs/hr)	Maximum Emissions (lbs/yr)	Annual Deminimus (lbs/yr)	Exceeds Deminimus? (Y/N)
TOTALS:										

* Potential emissions are based on full operation 24-hrs/day, 365 days/yr. Explain if "other" is checked.

** Maximum Use Rate - List the "worst case", maximum possible use rate of the product at this location to calculate maximum RTAP emissions.

*** Maximum, uncontrolled 24-hr average lbs/hr emission rate is calculated by dividing maximum, uncontrolled lbs/day by 24bhrs/day.